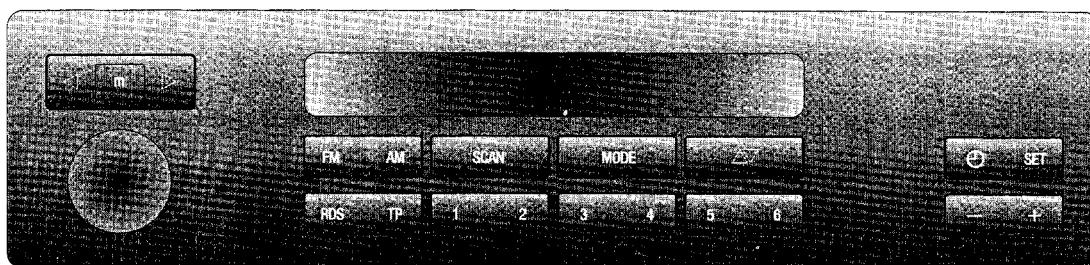


Service  
Service  
Service

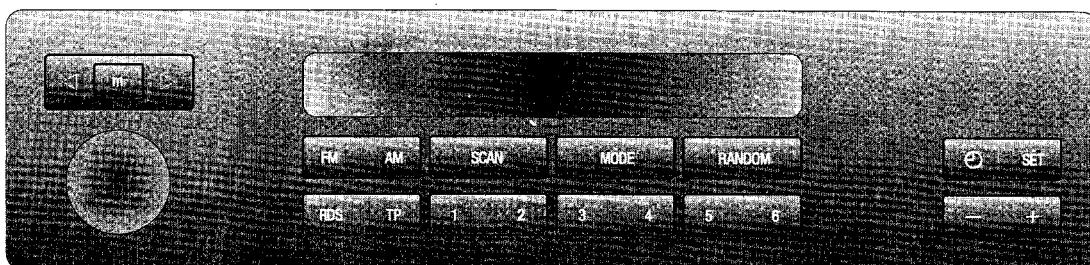
# Service Manual

12 V 

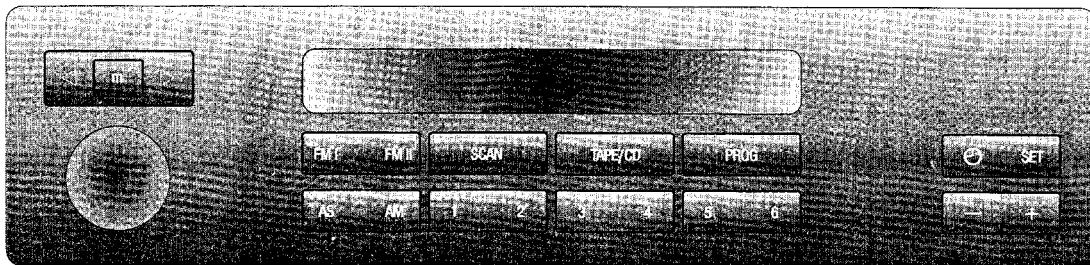
22SY686/23 (EUROPE)



22SY686/23R (JAPAN)



22SY686/23T (OCEANIA)



4821 725 23527

## CONTENTS

Page 2	General, Technical data
Page 3	Connectorblock, Controls and Display
Page 4	Radio functions
Page 5	Cassette operation, CD-operation
Page 6	CD changer operation, C33 / CD33 functions, Clock functions
Page 7	Blockdiagram IRIS (Integrated Radio Information System)
Page 8, 9	Supply voltages and signals
Page 10	Testmode, Eeprom
Page 11	Switch PWB, LCD PWB
Page 12	Circuit: Switches and Display
Page 13	Main PWB
Page 14	Circuit: Main
Page 15	Exploded view, mechanical parts
Page 16	Electrical parts

## GENERAL

The IRIS modul 22SY686 is the control- and display-unit for radio and clock in the car.

It does not work standalone.

To run this modul you have to connect the I-BUS line to the radiomodul 22DC786 (BMW C33) or 22DC986 (BMW CD33). You have to pullup this I-BUS connection with a resistor of 2,2 K $\Omega$  to permanent +.

However you can run the testmodes without the I-BUS connection (see chapter Testmode)

IRIS is also designed to control BMW carradios from other sources with possibly other functions as described in this Service Manual.

## TECHNICAL DATA

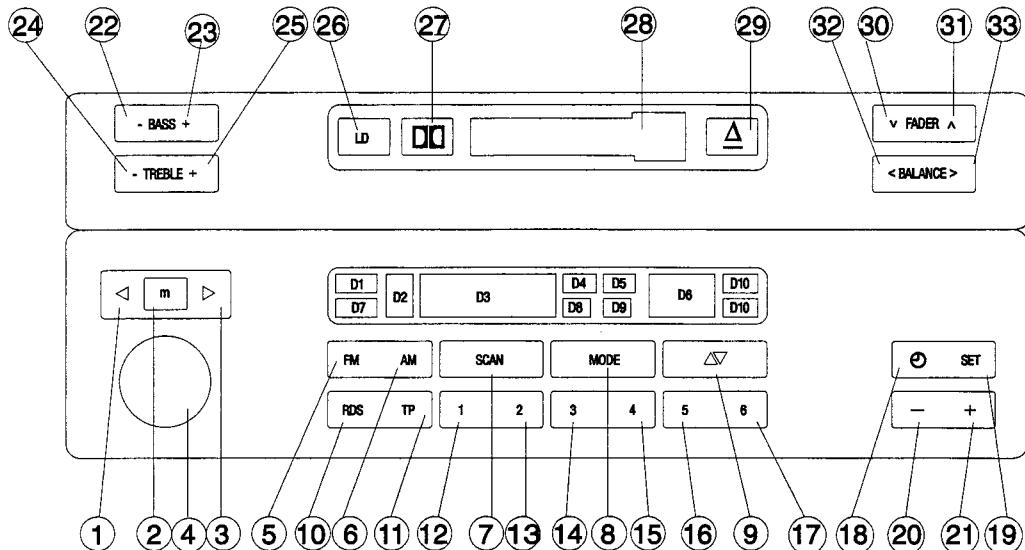
POWER SUPPLY	Voltage range: Quiescent current: Current consumption when activ, incl. illumination:	6 V – 16 V < 1 mA < 700 mA
DATA COMMUNICATION	Intern (MCU – EEPROM) Extern (IRIS – CAR)	I <sup>2</sup> C I-BUS
MCU (P89CE558EFB)	8 Bit controller – 11,059 Mhz 32 KB ROM 1 KB RAM I <sup>2</sup> C interface UART interface 2 PWM pins 8 channel 10 Bit A/D converter	
EEPROM	ST24C02AM6-013TR, 256 Bytes	
DISPLAY	Full dot matrix, 65 x 7 segments 5 symbols with 5 x 7 segments each 1 colon 15 fixed symbols $U_{DISPLAY} = 6,35$ V (nom. at 25°C)	

## CONNECTORBLOCK

6	5	4	3	2	1
12	11	10	9	8	7

1	GND (31E)	7	NC
2	PERM.+ (30)	8	IGN.KEY (R)
3	EXT.ILL. (58G)	9	NC
4	DATA (I-BUS)	10	NC
5	NC	11	NC
6	NC	12	NC

## CONTROLS



## IRIS

- 1 Tuning button down
- 2 Manual Tuning
- 3 Tuning button up
- 4 On/Off and volume
- 5 Selection of waveband FM
- 6 Selection of waveband AM
- 7 Station scan, CD title scan (optional)
- 8 Mode switch
- 9 Track selection of Cassette Deck
- 10 Activation of RDS
- 11 Activation of Traffic Program
- 12-17 Preset buttons 1-6, CD selection (optional)
- 18 Request clock display
- 19 Activation of clock setting
- 20 Clock setting button down
- 21 Clock setting button up

## C33 / CD33

- 22 Sound setting bass down
- 23 Sound setting bass up
- 24 Sound setting treble down
- 25 Sound setting treble up
- 26 Loudness on/off
- 27 Activation of Dolby
- 28 Cassette / CD compartment
- 29 Cassette / CD eject button
- 30 Sound setting rear
- 31 Sound setting front
- 32 Sound setting left
- 33 Sound setting right

## DISPLAY

D1 Indicator for of waveband, search levels, manual function  
 D2 Display of selected preset button  
 D3 Display of frequency, program name, cassette mode, CD number and track  
 D4 Indicator for RDS  
 D5 Indicator for Traffic Message Channel (currently not available)  
 D6 Display of clock  
 D7 Indicator for FM-Band Autostore  
 D8 Indicator for traffic program  
 D9 Indicator for 'Skip Blank' function (not available with C33 and CD33)  
 D10 Indicator for AM/PM in 12-h clock format

## RADIO FUNCTIONS

### Mode choice

Stepping through the different modes can be achieved by repetitive pressing of the Mode button [8]:

Tuner mode → Cassette, resp. CD mode → CD changer mode (optional) → Tuner mode a.s.o.

### Common hints to mode choice

If there is no medium (Cassette, CD-Magazine, CD) in the selected device or any malfunction is detected, the display [D3] shows an appropriate message:

– No cassette inserted:	Message NO TAPE
– No CD inserted:	Message NO DISC
– No magazine inserted into the changer:	Message NO MAGAZINE
– No CD in the magazine:	Message NO DISCS
– Faulty cassette:	Message TAPE ERROR
– Faulty or wrongly inserted CD:	Message CD ERROR
– Operation temperature exceeded:	Message HIGH TEMP

In these cases the device stays in the currently selected mode.

Nevertheless, the momentary impossible mode can be skipped by pressing the Mode button [8] again.

### Waveband choice

FM bands: tap FM button [5] FM I → FM II → FM AUTO

AM bands: tap AM button [6]: MW → LW → SW

### Station selection by automatic search

Press one of the tuning buttons < or > [1 or 3].

First run – search level 1, [D1] shows "I", second run – search level 2, [D1] shows "II".

Manual choice of selectivity: Search for strong stations: Tap tuning button [1 or 3] once.  
Search for weak stations: Tap tuning button [1 or 3] twice.

### Station selection by manual search

Press button m [2], the "MAN" indicator [D1] is lit. Tap tuning buttons to tune the frequency.

### Reception of a RDS station

Tap button RDS [10] to toggle between RDS on and off. Indicator [D4] shows status.

If a RDS station is received, the display [D3] first shows the frequency and afterwards the program service name.

### Regionalization

Press button RDS [10] for about 2 sec. Display [D3] will briefly indicate status REG ON / REG OFF

### Traffic program

Switch on/off by using TP button [11], [D8] indicates status.

Only stations providing traffic messages are received. The set automatically searches a TP station ("TP" blinking).

The Cassette- or CD-Operation will be interrupted during of a traffic message.

If a traffic program is received, but the TP-function is not activated, the indicator [D8] displays the character "T".

### Station storage manual

Press one of the preset buttons [12 – 17] about 2 sec. until the tuned station is audible again after a short mute.

### Autostore

Keep FM button [5] pressed until display indicates "AUTOSTORE".

The strongest FM stations are stored on the preset buttons [12 – 17] (waveband FM AUTO).

### Recall of a stored station

Select waveband [5 or 6] and tap desired preset button [12 – 17].

### Station scan

Tap SCAN button [7]. The frequency band is scanned upwards with selectivity level I.

If a station with sufficient strength is found, it gets audible for 8 seconds. Afterwards the searching is continued.

During the scan, the display [D3] toggles between the string "SCAN" and the frequency of the station.

The scan function can be aborted by pressing SCAN [7] again or by selection of any other radio function.

## CASSETTE OPERATION (only C33)

### Start cassette operation

Insert cassette into the compartment [28] **or** if there is already a cassette inside, tap the Mode-Button [8].

### Stop cassette operation

Press eject button [29]. The cassette is ejected **or** if the cassette should stay inside, tap the Mode-Button [8].

### Dolby noise reduction

With every tap on button [27] the function changes between "Dolby B", "Dolby C", "Off".

### Track selection

With every press of button [9], playback toggles between track 1 (NOR) and track 2 (REV).

### Fast winding

Tap button "m" [2] and then within 2 sec. tuning button [3] for fast forward winding or [1] for fast reverse winding.

Stop winding by pressing button [1 or 3] again or by selection of another function.

### Music search

Tap tuning button [1 or 3]. The tape winds to the begin of the next title, then the deck starts playback.

Stop search by pressing button [1 or 3] again or by selection of another function.

### Clean

After every 20 hours of cassette operation, the message "TAPE CLEAN" is displayed.

Clean head and tape guidings with a wet cleaning cassette.

## CD OPERATION (only CD33)

### Start CD operation

Insert CD into the compartment [28] **or** if there is already a CD inside, tap the Mode-Button [8].

### Stop CD operation

Press eject button [29], **or** if the CD should stay inside, press the Mode-Button [8].

If the CD is not removed from the player after eject, it is pulled in again automatically after a few seconds, but without changing to CD mode.

### Cue and Review playback

First tap button "m" [2], then within 2 seconds press and hold tuning button [1 or 3] for fast playback.

After releasing the button, or when reaching the begin/end of the disc, the player resumes normal playback.

After 8 sec. the MANUAL function will automatically switch off.

### Track up

Tap tuning button [3] to chose next track. If the button is held down, the track number is continuously incremented.

### Track down

Tap tuning button [1] once to restart the current track.

Tap twice to chose previous track. If the button is held down, the track number is continuously decremented.

### Scan search

Press SCAN button [7]. The tracks of the CD are played back for a few seconds in ascending order.

During the scan, the display [D3] toggles between the string "SCAN" and the number of the current track.

The scan function can be aborted by pressing "SCAN" [7] again or by selection of any other function.

### Random playback

Keep button "SCAN" [7] pressed, until "RANDOM" appears. The tracks are played back in random order.

The display [D3] toggles between the string "RANDOM" and the number of the current track.

The random function can be aborted by pressing button [7] again or by selection of any other function.

## CD CHANGER OPERATION (optional)

### Start CD changer operation

Insert magazine into the CD changer **or** if there is already a magazine inside, tap the Mode-Button [8].

### Stop CD changer operation

Press magazine eject button at the CD changer **or** if the magazine should stay inside, press the Mode-Button [8].

### CD selection

Press button [12 – 17] to chose the desired CD. If there is no CD in the selected slot, "NO DISC" appears.

### Cue playback, Track up/down, Scan search and Random playback

See the corresponding sections of the single CD operation.

## C33/CD33 CONTROLS

### Bass

Tap or keep pressed button [22] to decrease bass level and button [23] to increase bass level.

In the display, the current setting is indicated by the position of the vertical bar: BASS - \_\_\_\_ II \_\_\_\_ +

### Treble

Tap or keep pressed button [24] to decrease treble level and button [25] to increase treble level.

In the display, the current setting is indicated by the position of the vertical bar: TREB - \_\_\_\_ II \_\_\_\_ +

### Fader (front/rear)

Tap or keep pressed button [30] to increase the rear volume and button [31] to increase the front volume.

In the display, the current setting is indicated by the position of the vertical bar: FADR v \_\_\_\_ II \_\_\_\_ ^

### Balance (left/right)

Tap or keep pressed button [32] to increase the left volume and button [33] to increase the right volume.

In the display, the current setting is indicated by the position of the vertical bar: BAL < \_\_\_\_ II \_\_\_\_ >

### Loudness

Switch On/Off by tapping button [26].

### Tone Linear

To adjust all tone settings to their central position, keep button [26] pressed until "TONE LINEAR" appears.

### Volume adjustment

Adjust volume by turnknob [4].

## CLOCK FUNCTIONS (only available when set is connected to the timer modul of the car or the I-BUS tool)

### Request clock display

Tap button [18] to display the actual time for about 8 seconds (also possible with ignition off).

### Clock setting

If power supply was interrupted the clock has to be set initially. This is indicated by a blinking clock display.

Press button "SET" [19], in the display [D6], the segments for the minutes are blinking.

Press or keep pressed one of the clock setting buttons [20, 21] to increment or decrement the minutes.

If the minutes are adjusted correctly, press button "SET" [19] again. The segments for the hours are blinking.

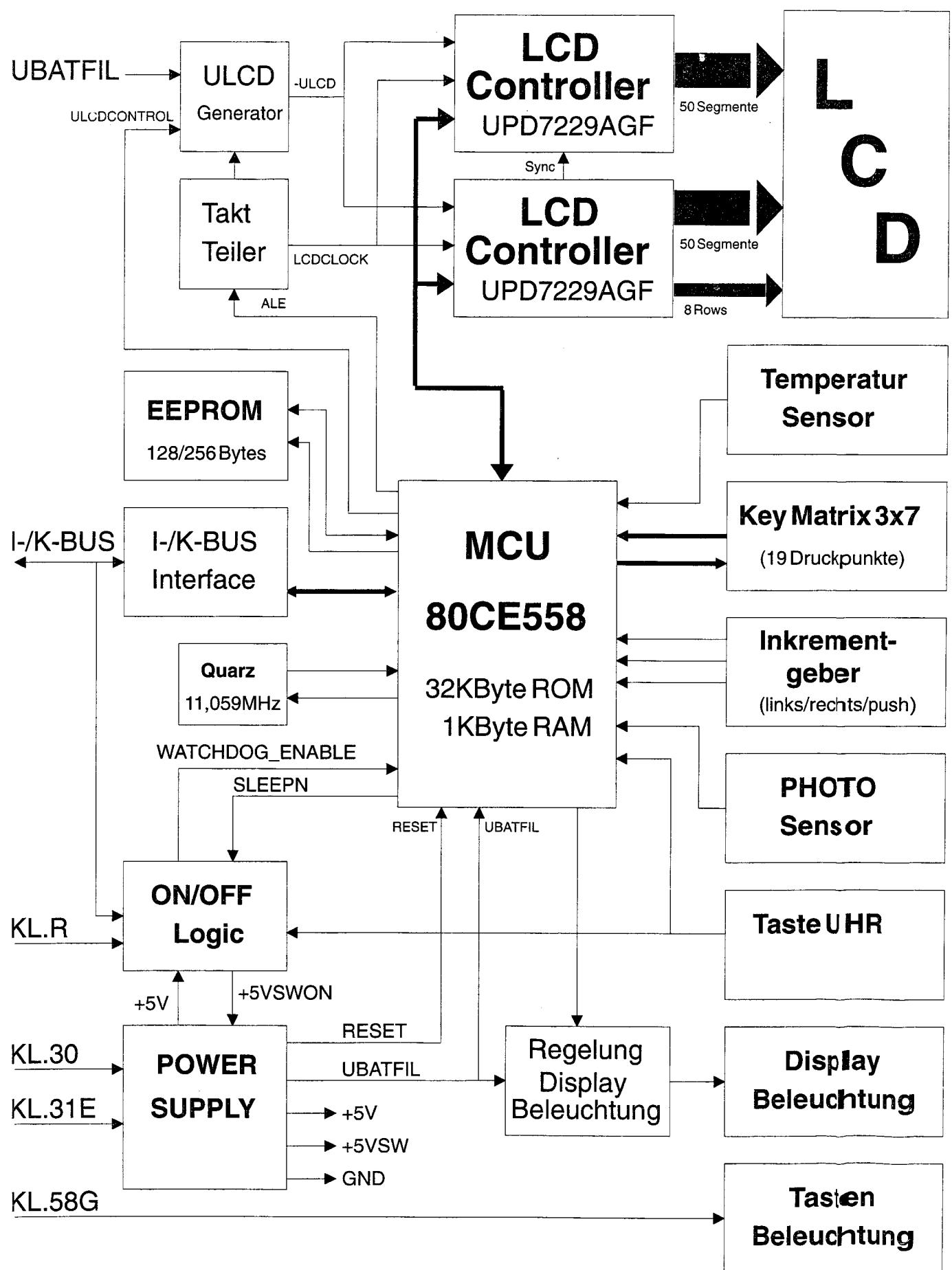
Press or keep pressed one of the clock setting buttons [20, 21] to increment or decrement the hours.

If the hours are adjusted correctly, press button "SET" [19] again to finish the setting.

### Cancel setting procedure

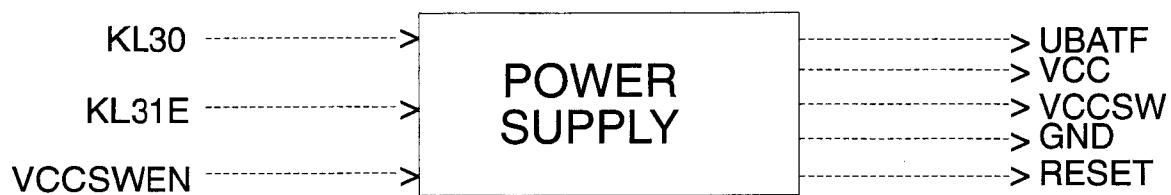
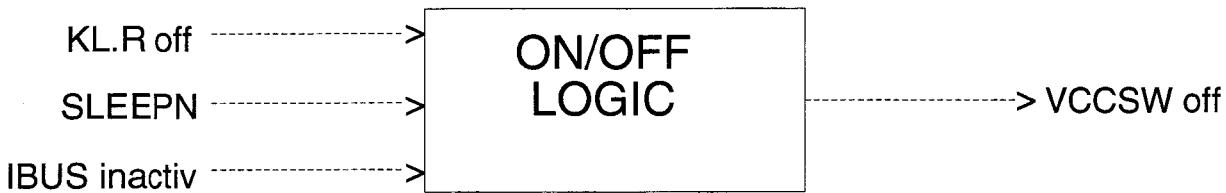
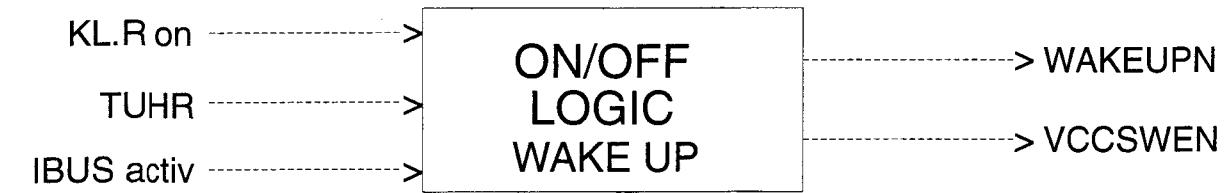
The setting procedure can be cancelled at any time by pressing the clock request button [18]. In this case, all previous manipulations of the clock are disregarded.

# Blockdiagramm IRIS



## SUPPLY VOLTAGES AND SIGNALS

### On/off logic and Power supply



KL.R	Ignition key voltage	14,0 V
KL.30	Battery voltage	14,0 V
KL.31E	GND	0,0 V
TUHR	Clock request	0,0 V when clock button pushed 5,0 V when button inactiv
IBUS	Data line (activ high)	High: 14,0 V Low during data communication
WAKEUPN	$\mu$ C start up signal (activ low)	Low: $\leq$ 0,9 V (20 ms) High: 5,0 V
VCCSWEN	Breaking voltage for VCCSW	$\leq$ 0,2 V
SLEEPN	$\mu$ C standby signal (activ low)	Low: $\leq$ 0,3 V High: 3 0,6 V
VCC	Supply voltage	+ 5,0 V (+/-2%), max. 50mA
GND	Ground	0,0 V
VCCSW	switched supply voltage	+ 5,0 V (+2%/-5%)
UBATF	filtered battery voltage for display illumination	> 13,0 V, max. 400mA
RESET	Reset-Signal (activ high)	Low: $\leq$ 0,8 V High: 3 3,85 V (10 ms) Reset when VCC < 4,5V

<b>Keymatrix</b>			
TROW1 - 7	Scan signal Row 1 - Row 7	5,0 V	
TCOL1 - 3	Scan signal Column 1 - Column 3	0,0 V	
5,0 V if concerned button is pushed			
<b>Photosensor signal</b>			
PHOTOSEN	Photosensor signal	5,0 V when dark	
		0,0 V when bright	
<b>Button illumination</b>			
KL58G	Extern illumination	14,0 V	
<b>Temperature sensor</b>			
TEMPSEN	Temperature sensor signal	2,5 V (25°C)	
		3,3 - 0,8 V for temp. range -40 to +80°C	
<b>Pulse switch</b>			
INRIGHT	turn right	0 V / 5 V alternating	
INLEFT	turn left	0 V / 5 V alternating	
INPUSH	push	5,0 V	
		0,0 V when pushed	
<b>Display illumination</b>			
UBATF	filtered battery voltage for display illumination	> 12,0 V, max. 400mA	
UDISIL	Return conductor from display illumination	5 - 12 V (brightness dependend)	
<b>Controller Interface</b>			
-ULCD	Negative LCD-Voltage	-1,8 V (25°C)	
ULCDCHK	Measuring voltage for LCD-Voltagecontrol	-2,7 - -1,0 V for temp. range -40 to +80°C	
LCDRESET	Reset-signal for LCD-Controller (activ high)	1,4 V	
LCDCLK	Clock for LCD-Controller	High: 5,0 V (20 ms) signal when KL30 on	
D0 - D3	Databits for LCD-Controller	Low: 0 V	
STBN	Standby not-signal for LCD-Controller	230,4 KHz	
BUSYN	Busy not-signal for LCD-Controller	Digital line	
C/DN	Control/Data not-signal for LCD-Controller	Digital line	
CSN	Chip select not-signal for LCD-Controller	Digital line	
KLRON	KL_R voltage control	Digital line	
PWMULCD	Pulse width modulated control signal LCD voltage	2,9 V	
PWMDISIL	Pulse width modulated control signal display ill.	ca. 200 Hz	
UBATCON	Battery voltage control	0 - 5 V (brightness dependend), ca. 200 Hz	
IBUSFIL	Filtered I-BUS signal	2,9 V	
ULCDCLK	Clock frequency for generation of -ULCD	13 V	
ALE	Clock generator for LCD controller	57,6 KHz	
		1843,2 KHz	
<b>Service connections (only used in production for software download)</b>			
RXD	RS232 receive signal (TTL-level)		
TXD	RS232 send signal (TTL-level)		
SCL	I <sup>2</sup> C-Bus clock signal		
SDA	I <sup>2</sup> C-Bus data signal		
SEN/STA	I-BUS control signal		

## TESTMODE

Hold buttons 10 (RDS resp. AS) and 17 (Preset 6) depressed while switching ignition on (14,4 V to clamp R).  
Display will show HXX SXX (XX = Version of hardware resp. software).

Push button 7 (SCAN) within 5 sec. for display test.  
One after the other all segments will be shown.  
After the display test the program returns to HXX SXX.

Push button 3 (MODE resp. TAPE/CD) within 5 sec. for button test.  
Display will show TASTE:—  
— will change to the concerned number when you push the buttons.  
After the button test the program returns to HXX SXX.

Push button 9 (UP/DOWN resp. RANDOM resp. PROG) within 5 sec. for incremental switch test.  
Display will show INKR.:—  
Turn the volume knob to the right: The number will increase to 36.  
Turn the volume knob to the left: The number will decrease to 00.  
After the incremental switch test the program returns to HXX SXX.

To leave the testmode switch set off or wait 5 sec.

## EEPROM

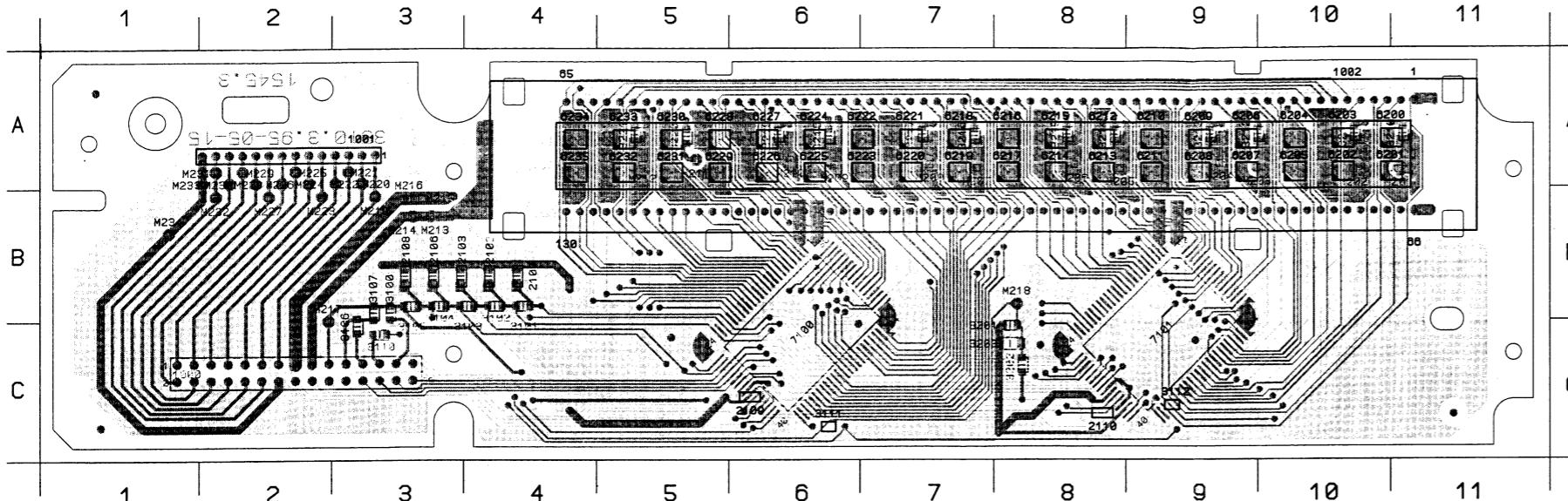
The Eeprom mentioned in the partslist is an empty one.  
This device can only be programmed with special equipment in factory Wetzlar.  
Without a correct programmed Eeprom the IRIS modul does not function according specification.  
(Power down, illumination control, LCD contrast)

**In case of a defect Eeprom send the set back to:**

Philips Apparatefabrik Wetzlar  
Department SP-CS  
Philipsstrasse 1  
D-35576 Wetzlar

Germany

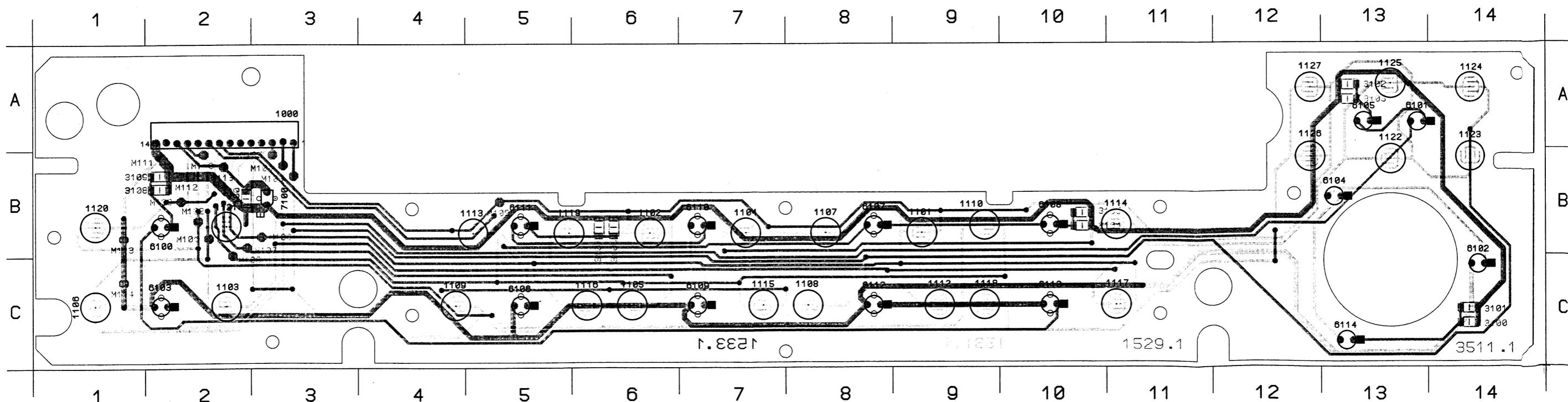
Display + Switch PWB



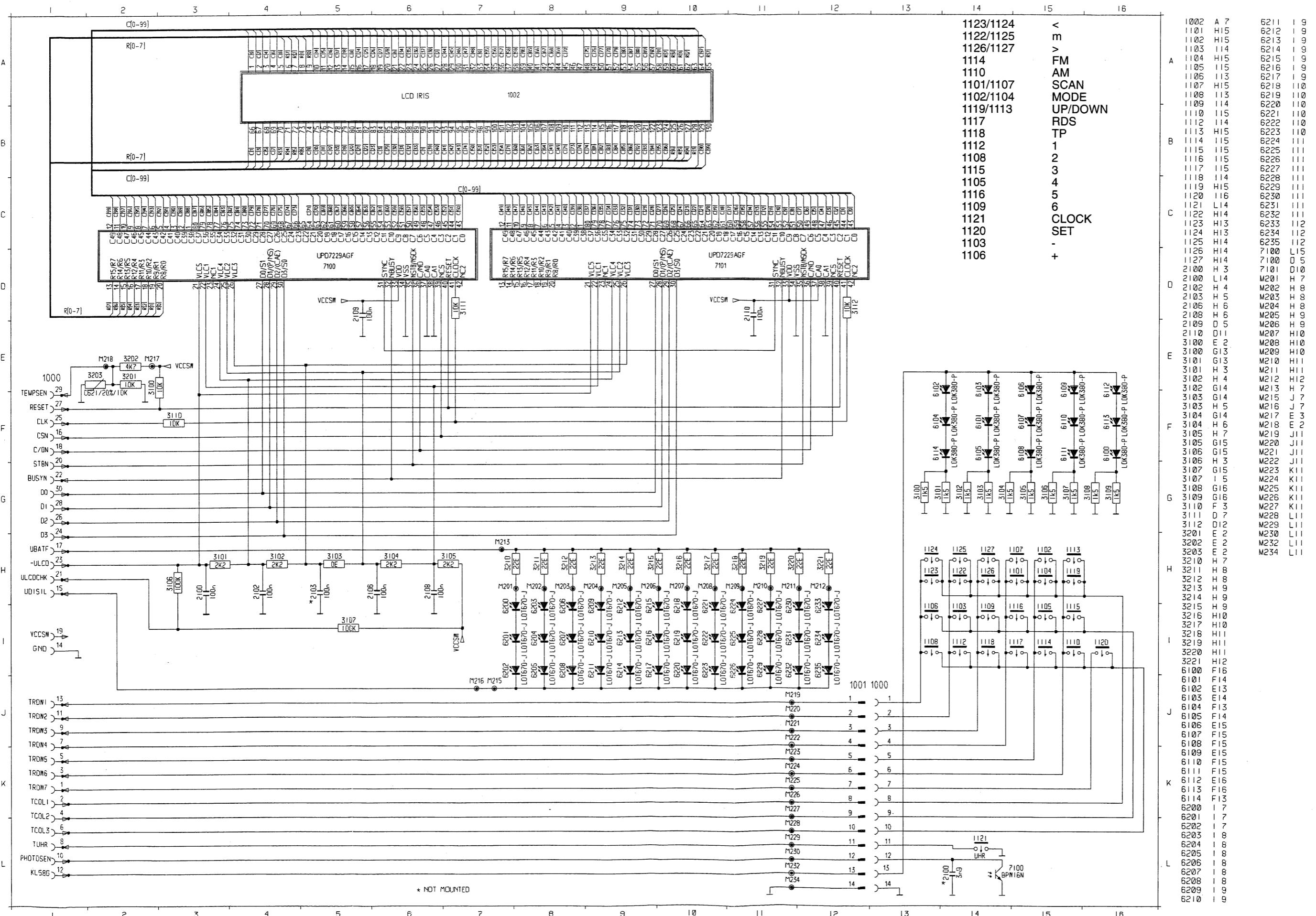
1000 C 2	6202 C 3	6208 A 9	6230 A 5	M215 B 3
1001 A 2	6203 C 3	6209 A 9	6231 A 5	M216 B 3
1002 A 7	6210 A 11	6210 A 9	6232 A 5	M217 B 2
2100 B 4	6211 A 10	6211 A 9	6233 A 5	M218 B 3
2102 B 4	6212 A 10	6212 A 8	6234 A 4	M219 B 3
2103 B 3	6213 A 9	6213 A 8	6235 A 4	M220 A 3
2106 B 3	6214 A 8	6214 A 8	7100 C 6	M221 A 3
2108 B 3	6215 A 8	6215 A 8	7101 C 9	M222 A 3
2109 C 6	6216 A 7	6216 A 8	M201 A 11	M223 B 2
2110 C 8	6217 A 7	6217 A 8	M202 A 10	M224 A 2
3100 B 3	6218 A 6	6218 A 7	M203 A 10	M225 A 2
3101 B 4	6219 A 6	6219 A 7	M204 A 9	M226 A 2
3102 B 4	6220 A 5	6220 A 7	M205 A 8	M227 B 2
3103 B 4	6221 A 5	6221 A 7	M206 A 8	M228 A 2
3104 B 3	6200 A 11	6222 A 7	M207 A 7	M229 A 2
3105 B 3	6201 A 11	6223 A 7	M208 A 7	M230 A 2
3106 C 3	6202 A 10	6224 A 6	M209 A 6	M231 A 2
3107 B 3	6203 A 10	6225 A 6	M210 A 6	M232 B 2
3110 C 3	6204 A 10	6226 A 6	M211 A 5	M233 A 2
3111 C 6	6205 A 10	6227 A 6	M212 A 5	M234 B 1
3112 C 9	6206 A 9	6228 A 5	M213 B 3	
3201 C 8	6207 A 9	6229 A 5	M214 B 3	

1000 A 2	1109 C 4	1119 B 5	2100 B 2	3108 B 2	6107 B 8	6108 B 10	6109 C 7	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3
1101 B 9	1110 B 9	1120 B 1	3100 C 14	3109 B 2	6107 B 8	6108 B 10	6109 C 7	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3
1102 B 6	1112 C 9	1121 B 2	3101 C 14	6100 B 2	6108 B 10	6109 C 7	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3
1103 C 2	1113 B 5	1122 B 13	3102 A 13	6101 A 13	6109 C 7	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3	7100 B 3
1104 B 7	1114 B 11	1123 B 14	3103 A 13	6102 C 14	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3	7100 B 3	7100 B 3
1105 C 6	1115 C 7	1124 A 14	3104 B 10	6103 C 2	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3	7100 B 3	7100 B 3	7100 B 3
1106 C 1	1116 C 6	1125 A 13	3105 B 10	6104 B 13	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3				
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1108 C 8	1118 C 9	1127 A 12	3107 B 6	6106 C 5	6114 C 13	7100 B 3	7100 B 3						

1000 A 2	1109 C 4	1119 B 5	2100 B 2	3108 B 2	6107 B 8	6108 B 10	6109 C 7	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3
1101 B 9	1110 B 9	1120 B 1	3100 C 14	3109 B 2	6107 B 8	6108 B 10	6109 C 7	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3
1102 B 6	1112 C 9	1121 B 2	3101 C 14	6100 B 2	6108 B 10	6109 C 7	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3
1103 C 2	1113 B 5	1122 B 13	3102 A 13	6101 A 13	6109 C 7	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3	7100 B 3
1104 B 7	1114 B 11	1123 B 14	3103 A 13	6102 C 14	6110 B 7	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3	7100 B 3	7100 B 3
1105 C 6	1115 C 7	1124 A 14	3104 B 10	6103 C 2	6111 B 5	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3	7100 B 3	7100 B 3	7100 B 3
1106 C 1	1116 C 6	1125 A 13	3105 B 10	6104 B 13	6112 C 8	6113 C 10	6114 C 13	7100 B 3	7100 B 3				
1107 B 8	1117 C 11	1126 B 12	3106 B 6	6105 A 13	6113 C 10	6114 C 13	7100 B 3	7100 B 3					
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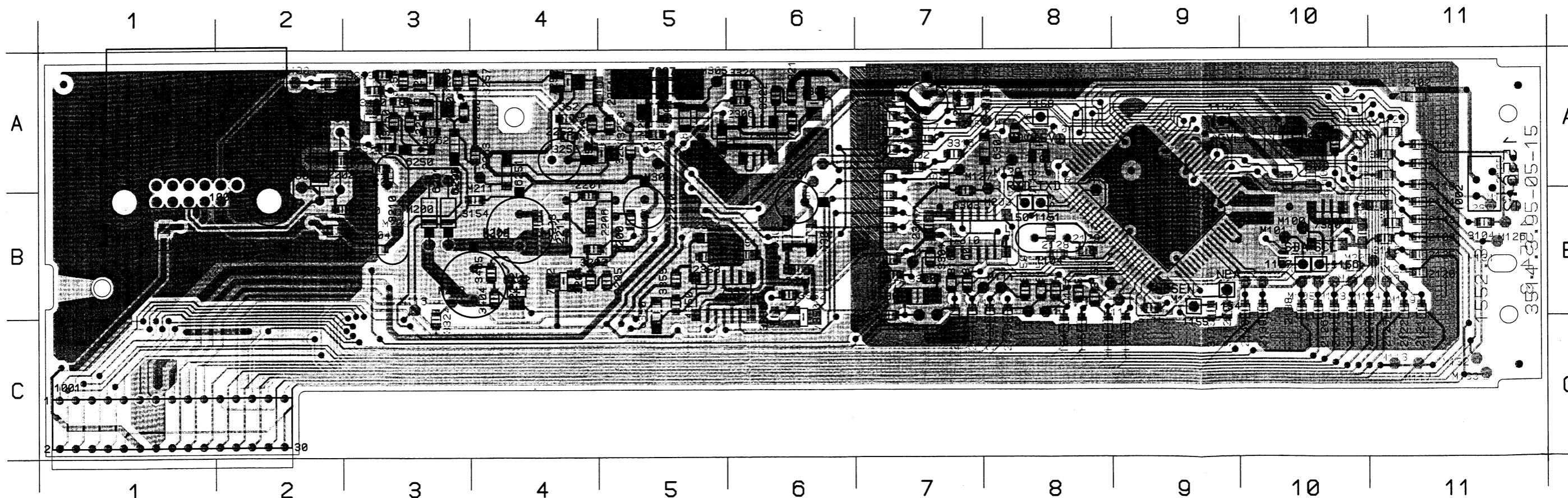


## Switches + Display



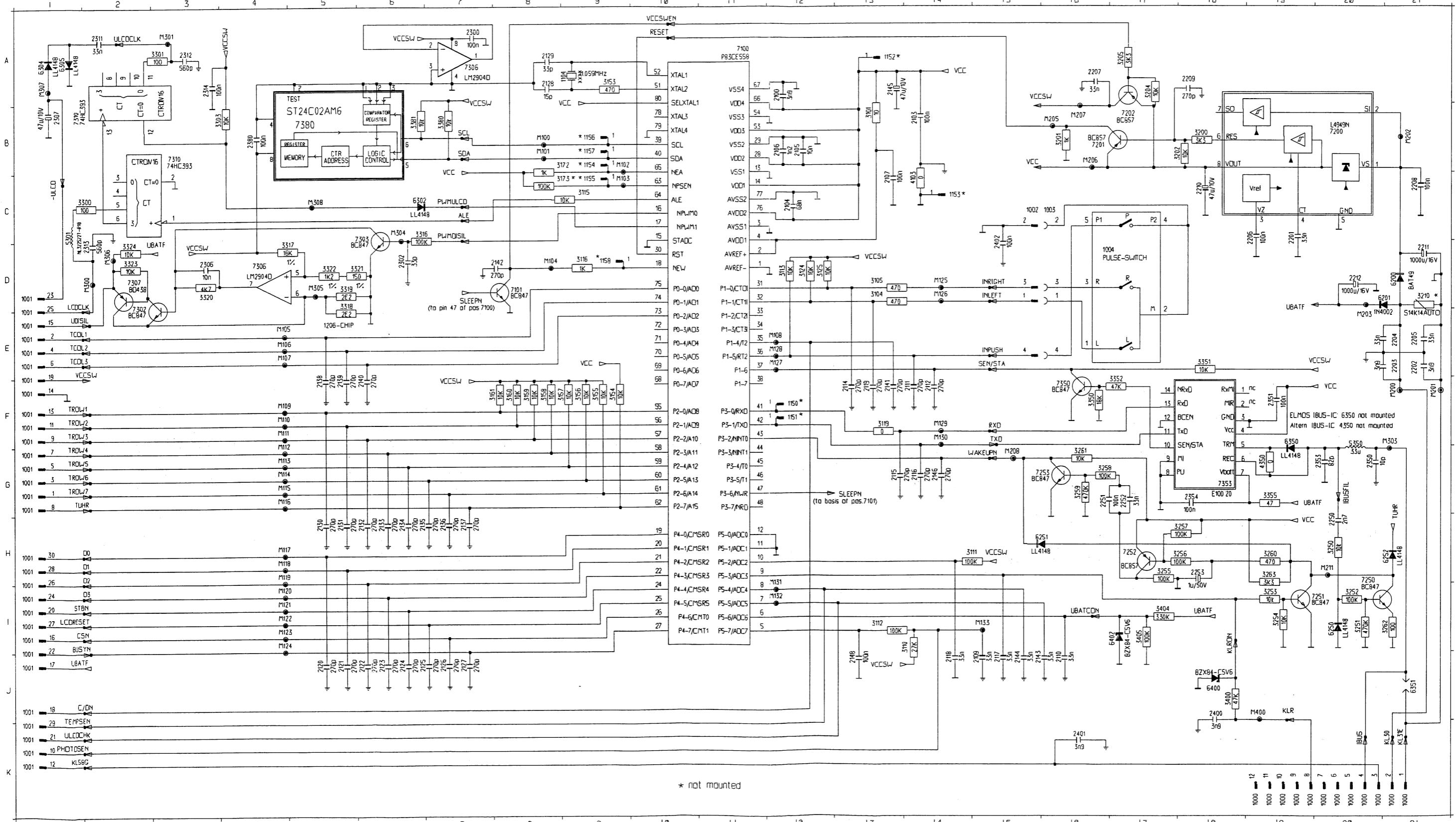
**Main PWB**

1000 B 1	2121 B 11	2204 B 3	3104 B 11	3252 A 3	3400 A 3	7306 A 3	M124 B 10
1001 C 1	2122 B 11	2205 A 3	3105 A 11	3253 A 3	3404 B 4	7307 A 5	M125 B 11
1002 A 11	2123 B 11	2206 B 4	3110 B 11	3254 A 3	3405 B 4	7310 B 7	M126 B 11
1104 B 8	2124 B 10	2207 B 7	3111 A 10	3255 A 4	4103 A 7	7350 B 6	M127 A 7
1150 B 8	2125 B 11	2208 B 4	3112 B 11	3256 A 3	4350 B 5	7353 B 5	M128 B 11
1151 B 8	2126 B 10	2209 A 7	3113 A 11	3257 A 4	5301 B 7	7380 B 10	M129 A 8
1152 A 9	2127 B 10	<b>2210 B 5</b>	3115 B 9	3258 A 5	<b>5350 A 2</b>	M100 B 10	M130 B 8
1153 A 10	2128 B 8	<b>2211 B 4</b>	3116 A 8	3259 A 4	<b>6200 B 3</b>	M101 B 10	M131 B 11
1154 B 9	2129 B 8	<b>2212 B 4</b>	3119 A 8	3260 A 3	<b>6201 B 3</b>	M102 B 9	M132 C 11
1155 B 9	2130 B 7	2250 A 3	3124 A 11	3261 A 5	6250 A 3	M103 B 9	M133 C 11
1156 B 10	2131 B 7	2251 A 4	3125 A 11	3262 A 3	6251 A 4	M104 A 8	M200 B 3
1157 B 10	2132 B 8	2252 A 4	3153 B 8	3263 A 4	6252 A 3	M105 B 10	M201 A 2
1158 A 8	2133 B 8	<b>2253 A 4</b>	3154 B 4	3300 B 7	6302 A 8	M106 B 10	M202 B 4
2100 A 10	2134 C 8	2300 A 5	3155 B 8	3301 B 7	6304 B 6	M107 B 10	M203 B 3
2103 A 7	2135 C 8	2302 A 7	3156 B 8	3303 B 7	6305 B 6	M108 B 10	M205 A 8
2104 A 10	2136 C 8	2306 A 6	3157 B 8	3316 A 7	6350 B 5	M109 B 7	M206 A 9
2105 A 10	2137 C 9	<b>2307 B 6</b>	3158 B 8	3317 A 6	<b>6351 A 2</b>	M110 B 7	M207 B 11
2106 A 9	2138 B 10	2311 B 6	3159 B 8	3318 A 5	6400 A 3	M111 B 8	M208 A 5
2107 A 10	2139 B 10	2312 B 7	3160 B 7	3319 A 5	6402 B 4	M112 B 8	M209 B 3
2109 B 11	2140 B 10	2313 B 7	3161 B 7	3320 A 6	7100 B 9	M113 B 8	M210 A 2
2110 A 7	2141 B 10	2314 B 7	3172 B 9	3321 A 6	7101 A 8	M114 B 8	M211 A 4
2111 A 11	2142 A 7	2350 B 2	3173 B 9	3322 A 6	<b>7200 B 4</b>	M115 B 9	M300 B 7
2112 A 7	2143 B 11	2351 B 6	3200 B 5	3323 A 5	7201 A 7	M116 B 3	M301 B 7
2114 A 11	2144 B 11	2353 B 5	3201 A 8	3324 C 3	7202 B 4	M117 C 11	M303 A 2
2115 B 7	<b>2145 A 7</b>	2354 B 5	3202 B 4	3350 B 6	7250 A 3	M118 C 11	M304 A 6
2116 B 7	2146 B 7	2380 B 10	3204 B 4	3351 A 7	7251 A 3	M119 B 11	M305 A 5
2117 A 7	2148 B 11	2400 A 2	3205 B 5	3352 B 6	7252 A 4	M120 B 11	M306 A 5
2118 A 10	2201 B 4	2401 B 1	<b>3210 B 3</b>	3355 B 5	7253 A 5	M121 B 10	M307 A 6
2119 A 11	2202 A 2	2402 A 11	3250 A 3	3380 B 10	7302 A 5	M122 B 11	M308 A 8
2120 B 11	2203 B 2	3101 A 10	3251 A 3	3381 B 10	7303 A 6	M123 B 10	M400 A 2

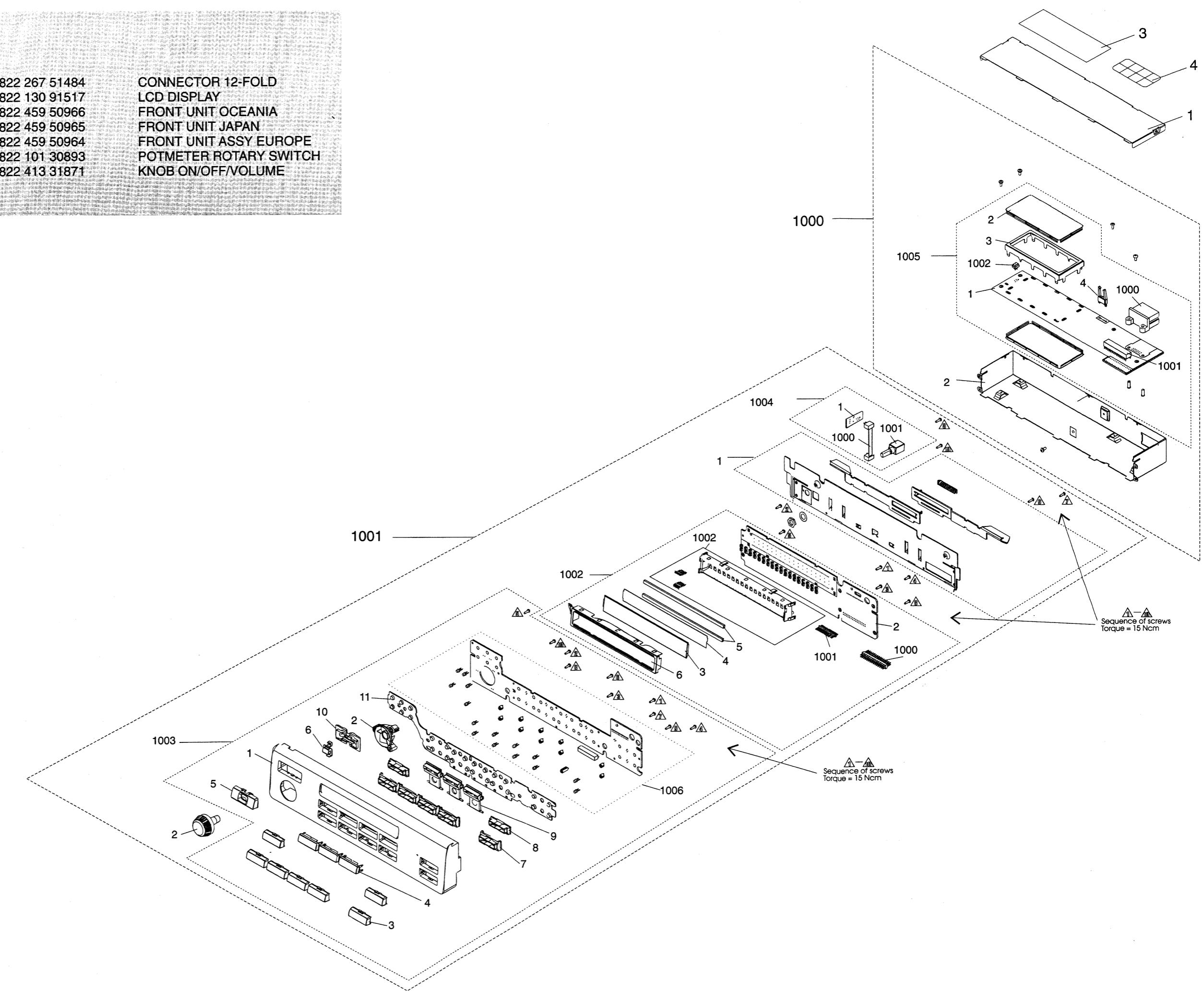


## Main

1000	K21	1001	E	1	1001	F	1	1104	A	9	2107	C13	2124	J	6	2139	F	5	2207	A16	2312	A	3	3111	H15	3160	F	8	3255	H17	3319	O	5	4103	C14	6402	I16	7310	B	3	M110	F	4	M125	D14	M207	B16
1000	K21	1001	G	1	1001	I	1	1150	F12	2109	J15	2125	J	6	2140	F	6	2208	C21	2313	D	2	3112	I13	3161	F	8	3256	H18	3320	O	3	4350	G19	7100	A11	7310	B	1	M111	F	4	M126	D14	M208	G15	
1000	K20	1001	E	1	1001	K	1	1151	F12	2110	J16	2126	J	7	2141	F13	2209	A18	2314	A	3	3113	O12	3172	B	9	3257	H16	3321	D	6	5301	C1	7101	D8	7350	F16	M112	G	4	M127	E12	M211	H20			
1000	K20	1001	G	1	1001	J	1	1152	A13	2111	F14	2127	J	7	2142	D	8	2210	C18	2350	G20	3115	C	9	3173	C9	3200	G16	3322	D	5	5350	G20	7200	B20	7353	G18	M113	G	4	M128	E12	M209	D2			
1000	K20	1001	G	1	1001	D	1	1153	C14	2112	F14	2128	A	8	2143	J15	2211	D21	2351	F19	3116	O9	3200	B18	3259	G16	3323	D	2	6200	D21	7201	B16	7380	B5	M114	G	4	M129	F14	M301	A3					
1000	K20	1001	F	1	1001	I	1	1154	B	9	2114	F13	2129	A	8	2144	J15	2212	D20	2353	G20	3119	F13	3201	B16	3260	H19	3324	O	2	6201	D21	7202	B17	M100	B8	M115	G	4	M130	F14	M303	F21				
1000	K20	1001	K	1	1001	E	1	1155	C	9	2115	G13	2130	H	5	2145	A13	2250	H20	2354	G18	3124	O12	3202	B18	3261	G16	3350	F15	6250	I20	7250	H20	M121	B8	M116	G	4	M131	I22	M304	C6					
1000	K19	1001	F	1	1001	I	1	1156	B	9	2116	G14	2131	H	5	2146	G14	2251	G16	2380	B4	3125	O12	3204	A17	3262	I21	3351	E18	6251	H16	7251	B9	M117	H	4	M132	I12	M305	D5							
1000	K19	1001	K	1	1001	I	1	1157	B	9	2117	J15	2132	H	6	2148	J13	2252	G17	2400	J18	3153	A	9	3205	A17	3263	H19	3352	F17	6252	H21	7252	H17	M123	C9	M118	H4	5	M133	I15	M306	D2				
1000	K19	1001	F	1	1001	H	1	1158	D	9	2118	J14	2133	H	6	2201	C19	2253	H18	2401	K16	3154	F	9	3210	O21	3300	C2	3355	G19	6302	C6	7253	G16	M104	O8	M119	H4	5	M200	F21	M307	A1				
1000	K19	1001	F	1	1001	K	1	2100	A12	2119	F13	2134	H	6	2202	E21	2300	A	7	2402	D15	3155	F	9	3250	H20	3301	A	3	3380	B7	6304	A1	7302	E2	M105	E4	M120	I4	5	M201	F21	M308	C5			
1000	K19	1001	E	1	1001	K	1	2103	B14	2120	J	5	2135	H	6	2203	E21	2302	D	6	3101	B13	3156	F	9	3251	I20	3303	B4	3581	B6	6305	A1	7303	C6	6106	E4	M121	I4	5	M202	B21	M400	J19			
1000	K19	1001	E	1	1001	H	1	2103	B14	2120	J	5	2135	H	6	2203	E21	2302	D	6	3101	B13	3157	F	9	3252	I20	3316	C6	3400	J18	6350	F19	7306	A7	M107	E4	5	M202	I4	M203	E20					
1000	G1	1001	I	1	1002	C15	1	2104	C12	2122	J	6	2137	H	7	2205	E21	2307	B	1	3105	D13	3158	F	8	3253	I19	3317	D5	3404	I17	6351	J21	7306	D4	M108	E12	M123	I4	5	M205	B16	M206	B16			
1000	E1	1001	J	1	1003	C16	1	2105	B12	2122	J	6	2137	H	7	2205	E21	2307	B	1	3105	D13	3158	F	8	3254	I19	3318	D5	3405	I17	6400	J18	7307	D2	M109	F4	M124	I4	5	M206	B16	M206	B16			
1000	G1	1001	J	1	1004	D16	1	2106	B12	2123	J	6	2138	F	5	2206	C19	2311	A	2	3110	I14	3159	F	8	3254	I19	3318	D5	3405	I17	6400	J18	7307	D2	M109	F4	M124	I4	5	M206	B16	M206	B16			



MECHANICAL PARTS	
1000-1005-1000	4822 267 51484
1001-1002-3	4822 130 91517
1001-1003	4822 459 50966
1001-1003	4822 459 50965
1001-1003	4822 459 50964
1001-1004-1001	4822 101 30893
1001-2	4822 413 31871
	CONNECTOR 12-FOLD
	LCD DISPLAY
	FRONT UNIT OCEANIA
	FRONT UNIT JAPAN
	FRONT UNIT ASSY EUROPE
	POTMETER ROTARY SWITCH
	KNOB ON/OFF/VOLUME



**ELECTRICAL PARTSLIST**

For all capacitors, resistors and coils not mentioned here, refer to standard component catalogue.  
Service code is 4822 736 53404

Miscellaneous

1104 4822 242 81646 CRYSTAL 11.059 MHZ

Capacitors

2109	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2110	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2117	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2118	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2143	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2144	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2145	4822	124	22646	CAP.ELECTROLYT.	47UF20%	16V
2201	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2204	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2205	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2207	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2210	4822	124	22646	CAP.ELECTROLYT.	47UF20%	16V
2252	4822	122	33342	CAP.CHIP	33NF10%X7R	63V
2253	4822	124	23282	CAP.ELECTROLYT.	1UF20%	50V
2307	4822	124	22646	CAP.ELECTROLYT.	47UF20%	16V
2311	4822	122	33342	CAP.CHIP	33NF10%X7R	63V

Resistors

3203	4822	116	30423	RES.N.T.C.	10K 20% NTC
3317	4822	117	11751	RES.METAL FILM	16K RC12H 1% 0805
3322	4822	117	11447	RES.CHIP	1K2 1% 0,1W

Coils

5301	4822	157	71777	COIL	0,18UH
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Diodes

6200	4822	130	70005	DIODE	BAT49
6201	4822	130	81196	RECTIFIER	S5566B
6250	4822	130	83338	DIODE,CHIP	LL4148
6251	4822	130	83338	DIODE,CHIP	LL4148
6252	4822	130	83338	DIODE,CHIP	LL4148
6302	4822	130	83338	DIODE,CHIP	LL4148
6304	4822	130	83338	DIODE,CHIP	LL4148
6305	4822	130	83338	DIODE,CHIP	LL4148
6351	4822	252	60125	SPARK GAP	DSP201
6400	4822	130	80125	DIODE,REFERENCE	BZX84-C5V6
6402	4822	130	80125	DIODE,REFERENCE	BZX84-C5V6

Transistors and IC's

7100	4822	209	90651	MICROPROCESSOR	P83CE558EFB/060 RC2
7100	4822	209	90649	MICROPROCESSOR	UPD7229AGF-030-3B9
7100	4822	130	41739	TRANSIST,PHOTO	BPW16N
7101	4822	209	90649	MICROPROCESSOR	UPD7229AGF-030-3B9
7101	4822	130	42705	TRANSISTOR,CHIP	BC847
7200	4822	209	90017	INTEGR.CIRCUIT	L4949N
7201	4822	130	61233	TRANSISTOR,CHIP	BC857
7202	4822	130	61233	TRANSISTOR,CHIP	BC857
7250	4822	130	42705	TRANSISTOR,CHIP	BC847
7251	4822	130	42705	TRANSISTOR,CHIP	BC847
7252	4822	130	61233	TRANSISTOR,CHIP	BC857
7253	4822	130	42705	TRANSISTOR,CHIP	BC847
7302	4822	130	42705	TRANSISTOR,CHIP	BC847
7303	4822	130	42705	TRANSISTOR,CHIP	BC847
7306	5322	209	12343	I.C. ANALOGUE	LM2904D
7307	4822	130	40995	TRANSISTOR	BD438
7310	5322	209	60427	INTEGR.CIRCUIT	74H393D
7350	4822	130	42705	TRANSISTOR,CHIP	BC847
7353	4822	209	33841	INTEGR.CIRCUIT	E100.20
7380	5322	209	52659	I.C. E-PROM	ST24C02CM6